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(71) Applicant *(for all designated States except US)*: **FRANCISFRANCIS INTERNATIONAL S.R.L.** [IT/IT]; Via Caboto 19, I-34147 Trieste (IT).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **FUSCO, Cosimo** [IT/IT]; Via G. Zanella 56, I-34127 Trieste (IT).

(74) Agents: **CONCONE, Emanuele** et al.; Società Italiana Brevetti S.p.A., Via Carducci, 8, I-20123 Milano (IT).

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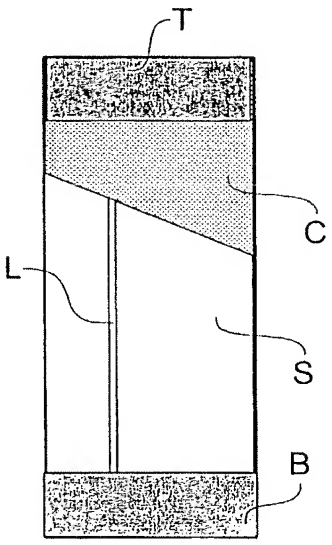
(54) Title: CARTRIDGE FOR THE PREPARATION OF A BEVERAGE



(57) Abstract: A cartridge for the preparation of a beverage consists of a lateral cylindrical surface (S) obtained by rolling of a sheet and welding thereof along a line (L), as well as a top base (T) and a bottom base (B) welded to the cylindrical surface (S) so as to close the apertures at the ends of the latter, both the cylindrical surface (S) and the bases (B, T) being made from a flexible and gastight material. In this way a cartridge is obtained with a regular shape and easy to manufacture that not only is cheaper, more efficient and more environmentally friendly than prior art cartridges, but it also allows to make a coffee machine that is cheaper, more practical and lighter and can even be totally automatic.

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"CARTRIDGE FOR THE PREPARATION OF A BEVERAGE"

The present invention relates to cartridges for the preparation of beverages, and in particular to a cartridge having an elongated cylindrical shape. Specific reference will be made hereafter to a coffee cartridge, while it is clear that what is being said is also applicable to the preparation of other similar beverages obtained from granulated or powdered substances (barley, chocolate, tea, infusions, etc.).

Cartridges for the preparation of beverages are known since many years, and they are used in machines in which the extraction of the beverage is performed by passing hot water through the cartridge. Prior art cartridges can be divided essentially into three types: a round flat cartridge (waffle) obtained by sealing the substance between two bands of flexible material, a short and wide cylindrical cartridge provided with openings on the bases and made of rigid plastic material, and a frustoconical aluminum cartridge sealed by a membrane applied on the aperture formed at the larger base.

An example of the first type of cartridge is found in US 3.607.297, that shows how this is the oldest and most unpractical type of cartridge. In fact it has various drawbacks: the machines that manufacture these cartridges are very slow, the appearance of the cartridge before and especially after use is not attractive, it is not possible to pressurize the content of the cartridge with inert gas to prevent the loss of aroma, and finally the automatic feeding of the cartridges in the machines that uses them can take place only be leaving them joined in a band which is quite cumbersome and unpractical.

The second type of cartridge is illustrated, for example, in US 4.471.689, WO 93/17932 and EP 1.042.978 and also has some drawbacks. In the first place it is an expensive cartridge with a high environmental impact, since it is made with a structure of rigid plastic material that in turn is enclosed by an airtight package. Furthermore, also in this case it is not possible to pressurize the content of the cartridge to prevent the loss of aroma, and it is not possible to obtain a simple automatic feeding since each cartridge must be removed from its package prior to use.

and in use, which can be summarized as follows:

a) the production is very fast since both the body and the bases are obtained from bands through simple operations: cutting, rolling and welding for the body and cutting and drawing for the bases that are subsequently welded to the body;

b) for the same amount of coffee there is required much less aluminum with respect to the third type of cartridge: when using multi-layer sheet material similar to the material used for the packaging of the second type of cartridge, the aluminum content is reduced by about 65%;

c) the regular shape allows to reduce to the minimum the size of the packaging, thus reducing the costs for packaging, transport and storage;

d) the regular shape allows to easily implement the automatic feeding of the cartridge: the package itself can even act as a hopper for the machine and the procedure to prepare a coffee can become a simple matter of pushing a button for the user;

e) the elongated cylindrical shape allows to change the coffee content within a very wide range simply by changing the body height without changing the cross-section thereof: it is therefore possible to obtain any kind of coffee from the short one to the long one (e.g. from 12 to 150 cc of coffee) depending on the cartridge dosage (e.g. from 2 to 20 g);

f) from the combination of the two previous points there is obtained the possibility of making a machine that automatically detects the cartridge length and consequently adjusts the water amount to be used for the extraction of the coffee;

g) the elongated cylindrical shape allows to significantly reduce the coffee content in low-dosage cartridges while retaining a thickness of the coffee layer sufficient to assure an optimal extraction; for example, when using a 5 g cartridge that contains only 3,7 g of coffee (the rest being inert gas) with the same amount of water, one can obtain a coffee of the same volume yet with a lower content in caffeine, so that the user can take his daily dose of caffeine divided over a greater number of coffees;

h) the small area of the aperture for the coffee outflow allows to obtain a higher

obviously other joining processes are also possible such as ultrasonic sealing, gluing and the like.

The diameter of the cartridge is indicatively between 15 and 30 mm, preferably about 24 mm, and its height is proportional to the dose of coffee C that it is intended to contain, as previously explained. The height/diameter ratio of the cartridge may obviously change according to the dosage as long as the elongated cylindrical shape is retained, i.e. the ratio is indicatively greater than 1,5:1.

It should be noted that the above-mentioned dimensions relate to a monodose coffee cartridge, but they could be freely changed according to the needs, namely according to the substance from which the beverage is extracted and/or to the number of doses of beverage to be extracted from a single cartridge (obviously a multidose cartridge is proportionally larger).

It should also be considered that since most of the advantages of the present cartridge stem from the elongated cylindrical shape thereof, in some cases one could decide to adopt other manufacturing processes that are different from the process illustrated above as long as the shape is retained. In such an instance there would not be the specific advantages of the use of the sheet material for cylindrical surface S, but advantages of other nature could be achieved.

For example, the cylindrical surface could be obtained by cutting an extruded tube so as to dispense with the sheet rolling and welding steps; or by deep drawing of an aluminum pellet or the like, so as to obtain a cylindrical surface with a base integral therewith and thus eliminate also the welding of said base.

It is therefore clear that the above-described and illustrated embodiment of the cartridge according to the invention is just an example susceptible of various modifications. In particular, bases B, T can be welded both on the inside (preferable in order to have the maximum free surface for the outside print) or both on the outside of cylindrical surface S, or with a reversed arrangement with respect to figure 1.

characterized in that its diameter is between 15 and 30 mm, preferably around 24 mm.

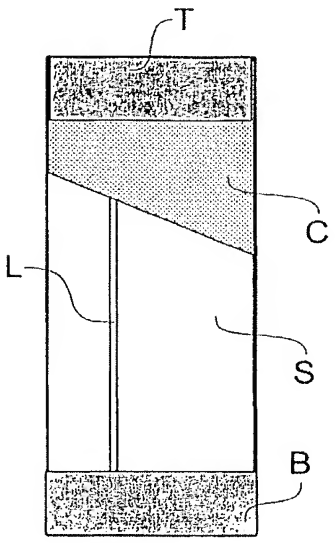

Fig.1

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B65D81/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B65D A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 02, 31 March 1995 (1995-03-31) -& JP 06 315349 A (GUREESU SANGYO KK), 15 November 1994 (1994-11-15) abstract	1,3,4,10
X	PATENT ABSTRACTS OF JAPAN vol. 014, no. 106 (C-0694), 27 February 1990 (1990-02-27) -& JP 01 310612 A (GURUME FOODS KK), 14 December 1989 (1989-12-14) abstract	1,3,4,10
A	EP 1 243 210 A (SOCIETE DES PRODUITS NESTLE S.A) 25 September 2002 (2002-09-25) figures	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Fournier, J